

A numerical index for evaluating phytoplankton response to changes in nutrient levels in deep mediterranean reservoirs

Aldo MARCHETTO*, Bachisio M. PADEDDA¹⁾, Maria A. MARIANI¹⁾, Antonella LUGLIÈ¹⁾ and Nicola SECHI¹⁾

CNR Istituto per lo Studio degli Ecosistemi, Largo V. Tonolli 50, 28922 Verbania-Pallanza, Italy

¹⁾Università degli Studi di Sassari, Dipartimento di Botanica ed Ecologia Vegetale, Via Muroni 25, 07100 Sassari, Italy

*e-mail corresponding author: a.marchetto@ise.cnr.it

ABSTRACT

This paper proposes a new ecological index based on phytoplankton (MedPTI) as suggested by the European Directive 2000/60/CE, Water Framework Directive (WFD). The index is a useful tool to verify the impacts of eutrophication in Mediterranean reservoirs belonging to different categories of the WFD. Multiple data sets were employed to develop the MedPTI index. The calibration data set included data collected from 30 Sardinian reservoirs in 1994. A list of 44 selected taxa was obtained and used for index calculation. A second dataset including 48 averaged annual values from 10 reservoirs was used. Results showed good correlation between MedPTI and concentration of total phosphorus, which was the limiting nutrient in these reservoirs. The trophic classifications determined using the index agreed with the results from the OECD probabilistic model on the same series of data. Finally, the index was included in an international exercise to compare the definition of reference conditions and quality class boundaries against indices used in other Mediterranean countries.

Key words: eutrophication, Water Framework Directive, Mediterranean ecoregion
